

(12) **UK Patent Application** (19) **GB** (11) **2 262 087** (13) **A**  
(43) Date of A publication 09.06.1993

(21) Application No 9222637.2

(22) Date of filing 28.10.1992

(30) Priority data

(31) 4139837

(32) 03.12.1991

(33) DE

(71) Applicant

**Windmüller & Hölscher**

**(Incorporated in the Federal Republic of Germany)**

**Munsterstrasse 50, 4540 Lengerich I W,  
Federal Republic of Germany**

(72) Inventor

**Heinrich Korte**

(74) Agent and/or Address for Service

**J A Kemp & Co**

**14 South Square, Gray's Inn, London, WC1R 5LX,  
United Kingdom**

(51) INT CL<sup>5</sup>

**B65H 23/32**

(52) UK CL (Edition L)

**B8R RRW9 R8M**

**U1S S1573 S1574**

(56) Documents cited

**None**

(58) Field of search

**UK CL (Edition K) B8R RRP RRW9**

**INT CL<sup>5</sup> B65H 23/32 27/00**

**Online databases: WPI**

(54) **Turning bar**

(57) A turning bar for altering the feed direction of a flattened plastic tubular film web is provided with a surface consisting of a copper base alloy. This eliminates corrosion problems associated with steel turning bars and results in a favourable coefficient of friction with the web passing over/around the surface. The alloy could be brass. The bar may be a coated steel tube with air-supply bores formed in the tube wall.

**GB 2 262 087 A**

---

## TURNING BAR

---

The invention refers to a turning bar, in particular for the application in a take-off apparatus for a plastic tubular film produced by a blowmolding process by means of an extruder.

Take-off apparatus for plastic tubular films are for instance known from the German Patent Specification 19 48 935 and from EP 0 191 114 B1.

In the EP 0 191 114 B1 the tubular film coming from the blowing head of the extruder is led to the squeezing apparatus where it is flattened between the corresponding flattening plates. Then the tubular film is fed through the slit towards two take-off or squeeze rollers. The flattened tubular film, which is free from air at the inside, comes from the slit between the take-off rollers to a first turning bar. From said turning bar, the flattened tubular film runs to a second turning bar and from the latter it then reaches a deflecting roller which already forms part of a winding-up apparatus.

In prior art, such turning bars have normally been made of steel. This is disadvantageous in that at the surface there occurs a rust formation, said rust coming into contact with the plastic tubular film when the system is operated which leads to a soiling of the plastic tubular film. Independent

thereof, the coefficient of friction of the otherwise smoothly polished turning bar will be increased. Even when there is a continuous operation, a rust formation may occur, in particular at the edge sections of the turning bar which do not have a constant contact with the plastic tubular film when the latter moves therealong, said rust being a source of interference when the tubular film strokes the edge sections. There have also been known turning bars consisting of hard-chromium plated steel. In this case the above-mentioned problem of corrosion will not occur, but such hard-chromium plated bars or rods have unfavourable coefficients of friction with the plastic tubular film web being trained therearound. But also turning bars coated with a Teflon layer have such negative coefficients of friction.

The object of the present invention thus is to provide a turning bar of the kind mentioned hereinbefore, over which corresponding plastic tubular film webs may be led without being soiled or damaged.

This problem is solved according to the invention in accordance with the characterizing part of claim 1 in that the surface of the turning bar consists of a copper base alloy. In this case it surprisingly showed that for instance in contrast to a Teflon coating the coefficient of friction with a corresponding plastic film is particularly advantageous. At the same time copper base alloys have the advantage that unlike iron they do not tend to the formation of oxide films which can be cleaned off, as for instance rust.

According to a preferred further development of the invention the surface consists of brass, i.e. of a copper-zinc alloy.

According to another aspect of the above-mentioned invention, the turning bar may consist of a steel pipe or tube coated with the copper base alloy.

In the following an advantageous embodiment of the invention will be explained.

Correspondingly, a turning bar consists of a steel tube or pipe which is provided with adjacent bores along a straight line over its entire length. Onto the steel tube or pipe there is applied a brass surface. Through the inside of the tube or pipe, which is closed on one side, pressurized air is forced which emerges through the above-mentioned bores. Thereby an air cushion is formed between the plastic tubular film web drawn over the turning bar and the surface of the turning bar, whereby at least the friction in the area of the bores is reduced. The remaining friction in the section of the spots of contact of the turning bar with the plastic tubular film web is comparatively low, since the surface of the turning bar consists of brass. Due to said combinatorial measures of the air cushioning and the additional reduction of friction in the sections in which the plastic tubular film comes into contact with the surface of the turning bar, the operatability of the turning bar will be considerably increased.

C L A I M S

1. A turning bar for a longitudinally moving web wherein said turning bar has a surface consisting of a copper base alloy.
- 5        2. A turning bar according to claim 1, wherein the surface consists of brass.
3. A turning bar according to claim 1 or 2, wherein the turning bar consists of a coated steel tube or pipe.
4. A turning bar according to any one of claims 1 to 10 3, when incorporated in a take-off apparatus for a plastic tubular film produced by a an inflation extrusion process.
5. A turning bar for a longitudinally moving web, according to claim 1 and substantially as hereinbefore described.

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**action 17 (The Search Report)**

Application number

GB 9222637.2

**Relevant Technical fields**

(i) UK CI (Edition L ) B8R (FRP, RRW9)

(ii) Int CI (Edition 5 ) B65H 23/32, 27/00

**Search Examiner**

E W BANNISTER

**Databases (see over)**

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

**Date of Search**

19 NOVEMBER 1992

Documents considered relevant following a search in respect of claims

1-5

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages -6-	Relevant to claim(s)

#### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).